

WHAT IS CLAIMED IS:

1. A damped electromagnetic inductor device, comprising:
at least one primary coil formed of a continuous conductor having first and second terminal ends, each primary coil having a helical winding section wound around an interior space, said at least one primary coil capable of producing magnetic field lines, wherein the interior space is intersected by said primary coil magnetic field lines;
and

at least one secondary closed loop formed of a continuous conductor and being electrically insulated from said primary coil, said secondary closed loop having a section wound around said interior space, said secondary closed loop capable of producing eddy currents in response to said primary coil magnetic field lines.

2. The damped electromagnetic inductor device of claim 1, wherein said at least one secondary closed loop comprises a single closed loop of conductive wire disposed around the exterior of said at least one primary coil.

3. The damped electromagnetic inductor device of claim 1, wherein said at least one secondary closed loop comprises a single closed loop of conductive wire disposed within the interior of said at least one primary coil.

4. The damped electromagnetic inductor device of claim 1, wherein said at least one secondary closed loop comprises a single closed cylindrical loop made from a conductive sheet disposed within the interior of said at least one primary coil.

5. The damped electromagnetic inductor device of claim 1, wherein said at least one secondary closed loop comprises a single closed cylindrical loop made from a conductive sheet disposed around the exterior of said at least one primary coil.

6. The damped electromagnetic inductor device of claim 1, further comprising:

a magnetically permeable frame including a magnetically permeable core dimensioned to fit within said interior space, said core carrying a frame member extending out of the interior space and defining a flux path for said primary coil magnetic field lines.

7. The damped electromagnetic inductor device of claim 6, wherein said magnetically permeable frame comprises first and second "E" frames each having a first outer leg opposing a second outer leg, with a central core disposed there between, and wherein said central core carries said primary coil and said secondary closed loop.

8. A damped electromagnetic inductor device, comprising:

at least one primary coil formed of a continuous conductor having first and second terminal ends, each primary coil having a helical winding section wound around an interior space, said at least one primary coil capable of producing magnetic field lines, wherein the interior space is intersected by said primary coil magnetic field lines;

an eddy current generating structure formed of a continuous segment of conductive, magnetically permeable material and being electrically insulated from said primary coil, said eddy current generating structure intersecting said interior space;

wherein said eddy current generating structure is capable of producing eddy currents in response to said primary coil magnetic field lines.

9. The damped electromagnetic inductor device of claim 8, further comprising:

a magnetically permeable frame including a magnetically permeable core dimensioned to fit within said interior space, said core carrying a frame member extending out of the interior space and defining a flux path for said primary coil magnetic field lines.

10. The damped electromagnetic inductor device of claim 9, wherein said eddy current generating structure is disposed in physical contact with and is configured to be in electrically conductive communication with said magnetically permeable core.

11. The damped electromagnetic inductor device of claim 9, wherein said eddy current generating structure is disposed in physical contact with and is configured to be electrically insulated from said magnetically permeable core.

12. The damped electromagnetic inductor device of claim 9, wherein said magnetically permeable frame comprises first and second "E" frames each having a first outer leg opposing a second outer leg, with a central core disposed there between, and wherein said central core carries said primary coil and wherein said eddy current generating structure is disposed in physical contact with said central core.

13. A tuned electrical filter circuit having selected frequency range of operation, comprising:

a damped electromagnetic inductor device with at least one primary coil formed of a continuous conductor having first and second terminal ends, each primary coil having a helical winding section wound around an interior space, said at least one primary coil capable of producing magnetic field lines, wherein the interior space is intersected by said primary coil magnetic field lines;

said damped inductor device also including an eddy current generating structure formed of a continuous segment of conductive, magnetically permeable material and being electrically insulated from said primary coil, said eddy current generating structure intersecting said interior space, and wherein said eddy current generating structure is capable of producing eddy currents in response to said primary coil magnetic field lines; and

wherein the Q of the inductor is tunable by varying the geometry of said eddy current generating structure.

14. The tuned electrical filter circuit of claim 13, wherein said filter circuit comprises a low pass filter.

15. The tuned electrical filter circuit of claim 14, wherein said low pass filter is part of a loudspeaker crossover network and is connected to a loudspeaker driver.

16. The tuned electrical filter circuit of claim 15, wherein said loudspeaker driver is adapted to receive acoustic vibrations microphonically and generate a microphonic signal in response, and said crossover network conducts said microphonic signal to said damped inductor device where at least part of the energy in said microphonic signal is attenuated in said eddy current generating structure.

17. The tuned electrical filter circuit of claim 13, further comprising:
a magnetically permeable frame including a magnetically permeable core dimensioned to fit within said interior space, said core carrying a frame member extending out of the interior space and defining a flux path for said primary coil magnetic field lines.

18. The damped electromagnetic inductor device of claim 17, wherein said eddy current generating structure is disposed in physical contact with and is configured to be in electrically conductive communication with said magnetically permeable core.

19. The damped electromagnetic inductor device of claim 17, wherein said eddy current generating structure is disposed in physical contact with and is configured to be electrically insulated from said magnetically permeable core.

20. The damped electromagnetic inductor device of claim 17, wherein said magnetically permeable frame comprises first and second "E" frames each having a first outer leg opposing a second outer leg, with a central core disposed there between, and wherein said central core carries said primary coil and wherein said eddy current generating structure is disposed in physical contact with said central core.